

SIEMENS

Siemens significantly improves sales management process during proposal creation by automated diagram validation

"It is incredible how much the whole process has been improved by the ability to have the diagram checked against validation rules to ensure correctness."

Uwe Heyns, Project Manager, Siemens Energy IT

Overview

Country or region: Germany
Industry: Manufacturing

Customer Profile

Siemens Energy Power Distribution Medium Voltage (E D MV) is a worldwide manufacturer of medium-voltage products and switchgear.

Business Situation

Siemens E D MV wishes to further optimize sales management to increase its competitiveness in a growing market by developing an innovative method of handling documentation complexities.

Solution

The company extended a solution based on Microsoft® Visio® 2007 to Visio 2010 that improves the sales proposal generation process through Diagram Validation.

Benefits

- Increases productivity
- Faster documentation delivery
- Embeds 3rd-party components

Overview

Siemens Energy Power Distribution Medium Voltage (E D MV) offers its customers innovative solutions, systems, and products for primary and secondary medium-voltage distribution levels. NXTools+ Graphics, initially built in 2006 and extended over the last few years, has grown into a highly acclaimed sales delivery tool for graphical output for the Siemens switchgear sales process. Customers have come to rely on the new diagram output that NXTools+ Graphics delivers. They also benefit from the fact that this tool uses one of the most powerful diagramming engines on the market, Microsoft® Visio®. Based on that success, the demands on the tool have increased tremendously and they now need to take this capability to a new level. Siemens was able to achieve their results using Visio Professional 2010.

“The huge success of NX Tools Plus and its graphical addition NX Tools Plus Graphics led to new demands from SIEMENS internal and external customers which increased the diagram complexity by several hundred percent. Which is normal when almost 1,600 users start using this solution – which initially was planned for about 150.”

**Šenaj Lelić, Managing Director,
maguro DataAssist GmbH**

Situation

The Siemens Business Unit E D MV produces switchgear for use in transformer and switching substations. Medium voltage switchgears are basic essentials of a supply network, used in primary or secondary distribution systems.

The quality and efficiency of its services, combined with its proximity to customers, have made Siemens E D MV one of the world leaders in the medium voltage field. Major customer groups include utilities and industries, including oil and gas, automotive, metals and mining, and chemical.

Business priorities

To remain competitive in the global distribution market, Siemens E D MV has identified specific business priorities that include the following:

- Supporting the sales organization with user-friendly and powerful sales delivery tools
- Reducing dependency on external service providers
- Optimizing sales management by providing efficient administrative processes

This led to the development of NXTools+ and its graphical extension NXTools+ Graphics in 2006. Since then, the sales delivery tool has been highly acclaimed and supported by both internal and external customers – and the solution is even being rented to third parties who are reselling Siemens’ switchgear systems. The first version already improved the sales process tremendously (see Figure 1).

The first version NXTools+ and NXTools+ Graphics were initially diagram types (Single Line, Front View, and Plan Views) for air-insulated switchgear. Due to the success of this first version, gas-insulated switchgear also joined the project; however, the new front views for gas-insulated switchgear increased the complexity of the creation algorithms considerably.

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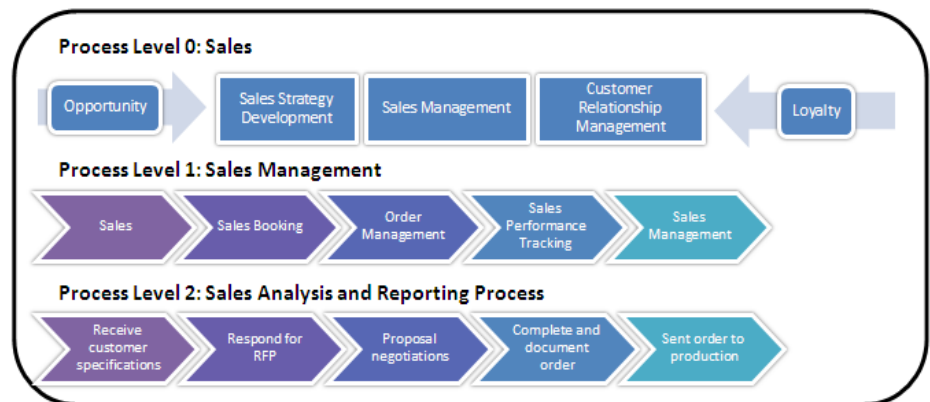


Figure 1: Methods & procedures of the sales management process and sub processes

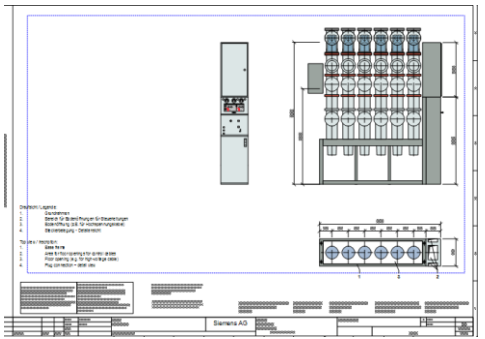


Figure 2: New diagram type of the specialized gas view

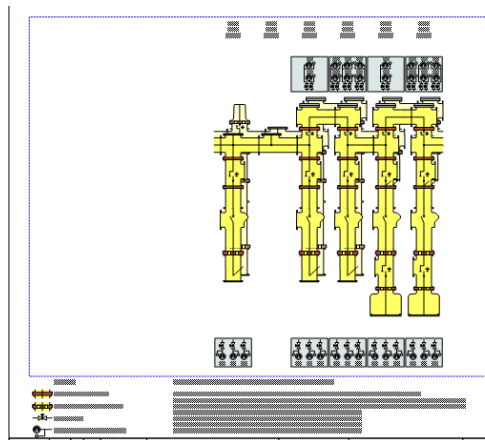


Figure 3: New diagram type gas fillings view

this solution – which initially was planned for about 150,” explains Šenaj Lelić, Managing Director of Microsoft Partner maguro DataAssist GmbH.

Overthrown by its own success

“NXTools+ Graphics was a victim of its own success,” says Uwe Heyns, Siemens’ project manager. “We added more and more functions to the tool, motivated by the great success we had with [Microsoft®] Visio® 2007 and the first release of NXTools+ Graphics.”

A few years ago, the users and product managers were offered a simple single line, front, and plan views. However, seeing the power and potential of the Visio graphical engine and platform, the customers came with new demands, such as “a configurable side-view compartment schema,” which introduced a new diagram type and even a new solution for standard-preconfigured switchgear systems. This facilitated the sales process by offering ready-to-sell, preconfigured systems. Just as auto manufacturers offer cars with a “sports package” that already include some options – so were the switchgear packaged in the “Wiring Manual” project for the new gas-insulated switchgear type 8DJH.

The first version of NXTools+ Graphics had to deal with four switchgear types, and the only documentation was for air-insulated switchgear. Over the years, more switchgear types have been added to bring today’s total to 21. This growth has brought a whole new set

of issues:

- For each switchgear type, individual front and plan views need to be created
- Each switchgear has its own rules of placement and component combinations
- With Siemens’ success in the switchgear sector, and the diagrams as a component of this process, new languages needed to be added to the tool – both in the user interface and in the documentation

When it was initially created, the tool was designed for extensibility. The use of Visio in the solution also introduced a huge advantage in the ease of extensibility for new components (third-party provided shapes) or diagram types (driven by new switchgear).

Exponentially increased number of components – new shape-creation methods

With every new switchgear type, new shapes also needed to be provided so that front diagrams and plan views could be created. When the first version was introduced, the diagrams were created purely through Visio shapes – the huge variability and amount of possible configurations made this approach unusable for the gas-insulated switchgear. In addition, the tool was used primarily for European and the U.S switchgear and later on for Chinese and Indian switchgear.

The strategy was to allow the local IT support to not only plan and build the switchgear interlocking in NXTools+, but also provide the

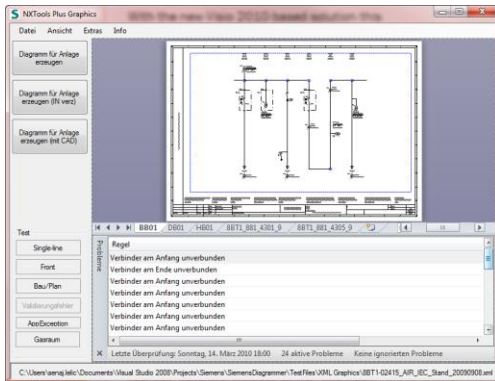


Figure 4: NX Tool plus Graphics with a diagram not fulfilling all rules

shapes and diagram parts that were to be imported into the documentation.

As appropriate as this approach is, it also introduced another problem: how to ensure not only the graphical quality of the shapes, but also the consistency of the shape metadata and the shape data containers that trigger the behaviour of the shapes.

Going beyond the placement of native Visio shapes

One of the diagram components came from DXF files provided by third-party suppliers. With Visio 2007, the import of these diagrams and files proved to be difficult since the import quality was not as desired. "Having a reliable and 100 percent CAD import is a vital, mandatory functionality that we must heavily rely on," says Holger Hermann from Siemens' Frankfurt production plant for medium-voltage gas-insulated switchgear.

Solution

By working with Visio 2010 and with the help of maguro DataAssist (a Microsoft partner), Siemens E D MV was able to add a new level of efficiency and robustness to the required diagrams. Visio 2010 introduced two functionalities in particular to the full solution that made it crucial to move to the new version as soon as possible:

- New and improved CAD import functionalities
- Diagram Validation and rules checking

New and improved CAD import

Since more and more components or diagram elements were initially imported from files provided by third parties, the quality of the imported files – that is, the Visio output – was crucial.

With the new and improved Visio 2010 DXF/DWG import, diagrams could now be imported with the necessary quality. In fact, using some diagram components was only made possible by the new and improved functionality in the CAD import.

"The accuracy of the new CAD import is incredible – the amount of work needed to finalize the import was literally reduced to zero," says Holger Hermann, one member of the switchgear team.

Rules for diagrams – Diagram Validation

One of the new features in Visio 2010 is the capability to define validation rules for the diagrams and have Visio check each diagram against these rules.

The validation rules check several areas of the diagrams:

- Do the shapes contain all necessary (shape) data? Missing data could result in faults in the diagram or non-responding shapes.
- Is the diagram built correctly? Errors in the diagram from a graphical point of view often introduced issues when the diagram was exported to other file formats.

For more information

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Diagram rules in NXTools+ Graphics at a glance

The Diagram Validation functionality now checks every diagram created against a predefined set of rules, which ensures data and shape consistency. Both factors help manage the increased amount of checking tasks when implementing shape and text elements that are delivered from outside of Siemens and need to be made part of the diagram(s).

This also adds a whole dimension of fault tolerance to the tool without the need to have each rule coded separately into the production code, which would decrease the creation performance – a factor that is also crucial when thousands of users are creating diagrams in parallel with the solution.

Benefits

Since the implementation of Visio 2010, Siemens E D MV has seen several improvements in overall tool usage and a great reduction in the time formerly invested in ensuring diagram consistency and accuracy. With this new version, checking for errors mainly consists of checking the rules output window. Heyns comments, "It is incredible how much time such an easy-to-overlook function can save in our everyday work."

Better integration of external data and graphics

Due to the new and improved DXF import, even files from non-current file formats or files with complex details are imported with high

accuracy. This greatly reduces the amount of time for redoing or correcting the imported components and speeds up the diagram creation process, especially the process of implementing and adding new switchgear or diagram types to the solution.

Ready for new, more complex diagram types

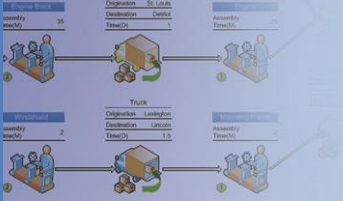
For this fiscal year and the coming year, five new switchgear types are planned – every one of them adding more complexity than any of the previous types. The new diagram types planned could previously only be implemented with great effort due to the high complexity of the visualization rules that apply to these diagram types. With the new Visio 2010 based solution, this becomes a feasible task, since new versions can be released more quickly and diagram accuracy can still remain at the level necessary to keep customers satisfied.

Ready for even more switchgear and users

The tool was initially created for 150 users, and now has reached 1,600 users worldwide, both internally and externally. Originally used only by Siemens in-house, the tool is now rented to partners and customers which could broaden the market for Siemens products worldwide.

Increase internal efficiency

Through the automation of the data transfer between both tools using the AutoCAD Interchange format exporting capabilities of Visio 2010, Siemens achieves a more efficient



process and significantly reduces potential transfer errors. The new tool makes the import of external data effortless and visualizes errors immediately without the need for manual searches.

Microsoft Visio 2010

The advanced diagramming tools of Microsoft® Visio® 2010 help you simplify complexity with dynamic, data-driven visuals and new ways to share on the Web in real-time. Start by building your diagram with a diverse set of professional-looking templates and modern, pre-drawn shapes. Then, easily link your diagram to popular data sources (such as Microsoft® Office Excel®). You'll see data automatically refresh right within your diagram, reflected in vibrant visuals such as icons, symbols, colors, and bar graphs. Finally, with just a few clicks, publish your data-linked diagram to Microsoft® SharePoint® Server 2010, and provide access to others on the Web, even if they don't have Visio. Together, simplicity, data-driven shapes, and Web sharing make Visio one of the most powerful ways to see and understand important information.

For more information about Microsoft Visio 2010, go to:

www.visio.com

- Software and Services
 - Microsoft Visio Professional 2010